

Attorney Docket No.: 90046PCT

Customer No.: 20529

MAIL STOP PCT

FILING RECEIPT

PCT RECEIVING OFFICE SECTION

In re application of: BROADBAND INNOVATIONS, INC.

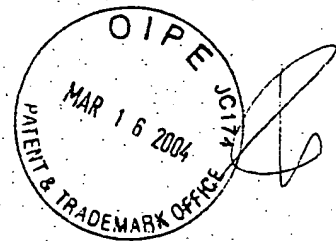
International Application No.: PCT/US03/20064

Filed: 26 June 2003 ( 26.06.2003)

Title: EVEN ORDER DISTORTION ELIMINATION IN PUSH-PULL OR  
DIFFERENTIAL AMPLIFIERS AND CIRCUITS

DOCUMENTS BEING FILED:

THE PTO STAMP HEREON ACKNOWLEDGES RECEIPT OF:



- (1) Transmittal Letter;
- (2) Response to Notification of Transmittal of International  
Search Report;
- (3) Copy of PCT/ISA/220 and PCT/ISA/210 with cited reference.

Date: March 16, 2004

NATH & ASSOCIATES PLLC  
1030 15<sup>th</sup> Street, N.W.  
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Prepared by: *dd*

Approved by: *WLB*

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Filed by:

GMN/MCB/dd:I:ResponseISR\_fr

JT12 Rec'd PCT/PTO 21 DEC 2004

IN THE UNITED STATES INTERNATIONAL SEARCHING AUTHORITY

In re application of: BROADBAND INNOVATIONS, INC.

PCT International Application No.: PCT/US03/20064

Attention: Henry Choe

Filed: 26 June 2003 (26.06.2003)

Title: EVEN ORDER DISTORTION ELIMINATION IN PUSH-PULL OR  
DIFFERENTIAL AMPLIFIERS AND CIRCUITSTRANSMITTAL LETTERCommissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450


March 16, 2004

Applicant hereby submits the following documents pertaining to the  
captioned PCT International Application:

- (1) Transmittal Letter;
- (2) Response to Notification of Transmittal of International  
Search Report;
- (3) Copy of PCT/ISA/220 and PCT/ISA/210 with cited reference.

Respectfully submitted,

NATH &amp; ASSOCIATES PLLC

Gary M. Nath  
Marvin C. Berkowitz  
Agents of RecordDate: March 16, 2004Nath & Associates PLLC  
1030-15<sup>th</sup> Street, N.W.  
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DT12 Rec'd PCT/PTO 21 DEC 2004

IN THE UNITED STATES INTERNATIONAL SEARCHING AUTHORITY

In re application of: BROADBAND INNOVATIONS, INC.

PCT International Application No.: PCT/US03/20064

Attention: Henry Choe

Filed: 26 June 2003 (26.06.2003)

Title: EVEN ORDER DISTORTION ELIMINATION IN PUSH-PULL OR  
DIFFERENTIAL AMPLIFIERS AND CIRCUITS

RESPONSE TO NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH  
REPORT

Commissioner for Patents  
United States Searching Authority  
P.O. Box 1450  
Alexandria, VA 22313-1450

March 16, 2004

Dear Examiner Choe:

Applicant is returning the International Search Report PCT/ISA/220 and PCT/ISA/210 with cited reference US 5,041,235 (Kilbarger). Applicant states that the cited reference is not related in any way to the technology of the captioned application and believes that the reference was sent in error.

Applicant respectfully requests that Examiner Choe review the International Search Report with the cited reference and issue a corrected International Search Report.

Respectfully submitted,

NATH & ASSOCIATES PLLC



Gary M. Nath  
Marvin C. Berkowitz  
Agents of Record

Date: March 16, 2004

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1030 15<sup>th</sup> Street, N.W.  
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# PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: GARY M. NATH  
NATH & ASSOCIATES PLLC  
1030 15TH STREET, NW, 6TH FLOOR  
WASHINGTON, DC 20005-1503

## PCT

### NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

Date of Mailing  
(day/month/year)

**04 MAR 2004**

Applicant's or agent's file reference  
90046PCT

FOR FURTHER ACTION - See paragraphs 1 and 4 below

International application No.  
PCT/US03/20064

International filing date  
(day/month/year)  
26 JUNE 2003

Applicant  
BROADBAND INNOVATIONS, INC.

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.  
**Filing of amendments and statement under Article 19:**  
 The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):  
**When?** The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.  
**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes,  
 1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 740.14.35  
 For more detailed instructions, see the notes on the accompanying sheet.
2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.
3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
  - ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
  - ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

#### 4. Reminders

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Authorized officer

HENRY CHOE

*Sharon J. Hoppe*

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## NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article," "Rule" and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

### INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

#### What parts of the international application may be amended ?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Preliminary Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

**When ?** Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

#### Where not to file the amendments ?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

**How ?** Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

#### What documents must/may accompany the amendments ?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

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## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 90046PCT	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US03/20064	International filing date (day/month/year) 26 JUNE 2003	(Earliest) Priority Date (day/month/year) 27 JUNE 2002
Applicant BROADBAND INNOVATIONS, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No. 2A

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

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## Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The technical features mentioned in the abstract do not include a reference sign between parentheses (PCT Rule 8.1(d)).

A method for improving or eliminating second harmonic and higher even order distortion terms and balance of fundamental signals in push-pull amplifiers and other differential circuits is disclosed. A common-mode (CM) signal is generated as a sum of two complementary (out of phase) signals in a summation network (32). The CM signal contains even order distortion terms only, while the fundamental signal and odd order distortion terms are canceled, thus providing a correction signal that can be used to reduce even order distortion terms, by injecting the correction signal, with proper phase and amplitude, into suitable circuit nodes. For feedback (70), the correction signal is injected at the input (56, 58) of the amplifiers (16, 18), for feed-forward, it's injected at the output. The correction signal can be amplified to higher levels and injected into the circuit, without affecting gain of fundamental signals; and can result in significant even order distortion improvements, and improved balance of complementary fundamental signals.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/20064

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H03F 1/26

US CL : 330/69, 107, 109, 149, 301

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 330/69, 107, 109, 149, 301

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
amplifier and distortion

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,041,235 A (KILBARGER) 20 August 1991 (20.08.1991), see entire document.	1-42

☐ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

•	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

11 SEPTEMBER 2003

Date of mailing of the international search report

04 MAR 2004

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks

Authorized officer

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